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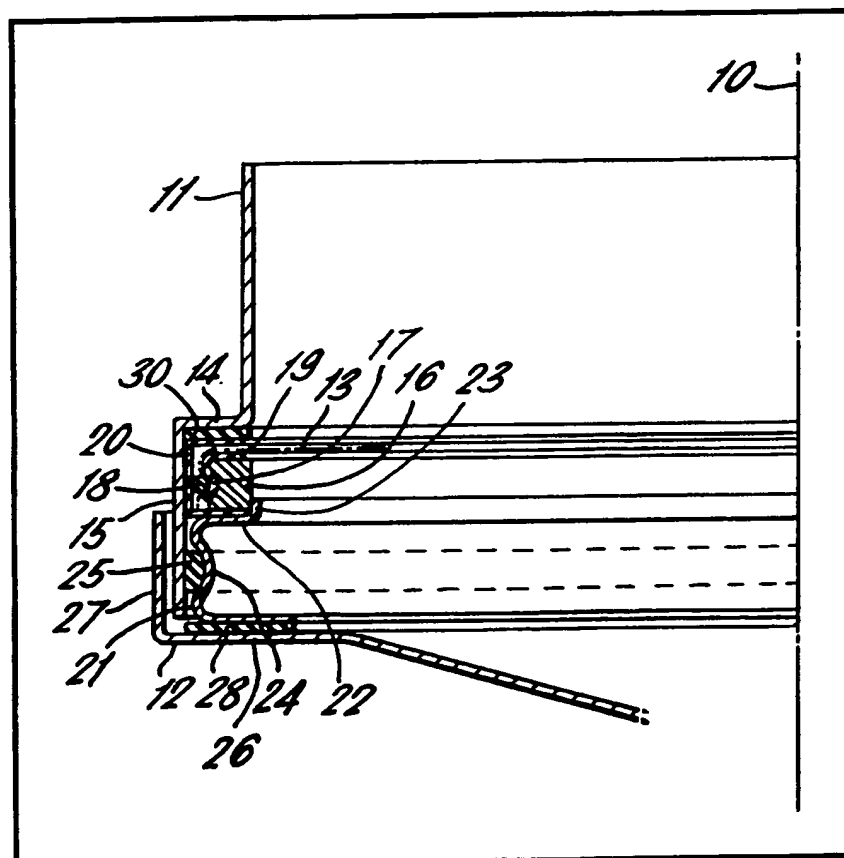
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(54) Screen assembly locating ring
for a circular sieving machine

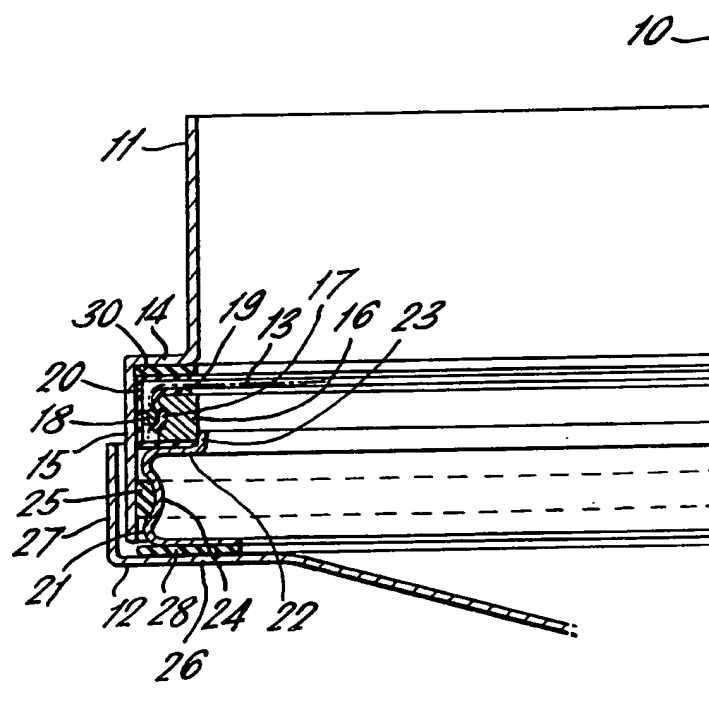
(57) A circular sieving machine has a demountable rim (11) in which the screen (13) is mounted. The screen (13) and its support ring (16) are held in place in a lower skirt portion (15) of the rim by a locating ring (21) which bears up against the support ring (16). The locating ring (21) has an O-ring seal (25) sealing it to the inside of the skirt (15) and providing a friction fit of the locating ring in the skirt.



The drawing originally filed was informal and the print here reproduced is taken from a later filed formal copy.

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SPECIFICATION

Screen assembly locating ring for a circular sieving machine

5 The present invention relates to circular sieving machines and in particular to a screen assembly locating ring for use in such a machine and sieving machines incorporating this locating ring.

10 One kind of circular sieving machine has a circular sieve screen which is arranged in the machine to be in a substantially horizontal plane. The machine operates to vibrate the screen, together with the part of the machine in which the screen is mounted, in a substantially horizontal plane. However, it is also normal with such machines for the screen to have a component of vibration in the vertical direction. In the kind of machine under consideration, the screen comprises a flexible mesh which is mounted on a relatively rigid support ring. The mesh is fixed or clamped about the periphery of the support ring so that the mesh is maintained under tension in all directions. The screen when mounted on its support ring is referred to hereinafter as the screen assembly. To enable the screen of a sieving machine to be removed for replacement, e.g. when damaged or when to be exchanged for a screen of different mesh size, the screen assembly is located in a demountable rim. The rim comprises a substantially cylindrical body, open at both ends. The rim has an annular shoulder and is mounted on the sieving machine, with the axis of the cylinder substantially vertical, and the outer surface of the annular shoulder directed upwards. The part of the rim beneath the shoulder thus forms a downwardly directed skirt portion of slightly greater diameter than the rest of the rim. The screen assembly is located inside this skirt portion of the rim up against the inside surface of the annular shoulder. A locating ring is then fitted into the skirt portion to locate the screen assembly against the annular shoulder so that the rim complete with screen assembly and locating ring forms a detachable assembly which can be removed from the rest of the sieving machine. The complete demountable rim assembly is located in the sieving machine on top of the under-pan of the machine, which collects the fines passing through the screen, and is fastened to the under-pan by one or more clamps engaging the outer surface of the annular shoulder of the rim and pressing it downwards against the under-pan.

60 With this construction, it can be seen that in order to remove a screen assembly the clamps can be disengaged from the rim and the entire demountable rim with the screen assembly inside can be removed from the sieving machine. In order to remove the screen assembly from the rim it is necessary

then to remove first the locating ring so that the screen assembly itself can be withdrawn. This kind of sieving machine will be referred to hereinafter as the sieving machine of the kind described.

70 Hitherto, it has been normal practice to form the locating ring of sieving machines of the kind described as an annular member which is cut at at least one point in its circumference. A clip arrangement is then provided which can force the parts of the annular member on either side of the cut apart so that, when the locating ring is positioned inside the skirt of the demountable rim, it can be locked in position by operating the clip to force the locating ring outwards against the inside surface of the skirt.

According to the present invention, there is provided a circular sieving machine of the kind described wherein the screen assembly locating ring is formed as a complete annulus fitting inside the downwardly extending skirt portion of the demountable rim and deformable sealing means is located between the outer periphery of the locating ring and the skirt portion to enable the locating ring to be pushed into the skirt against the screen assembly to locate the screen assembly in the rim with the sealing means deforming and providing a seal between the skirt of the rim and the locating ring.

This arrangement enables the locating ring to be inserted into the skirt of the demountable rim relatively easily simply by pushing it into the skirt. The sealing means deforms to enable the locating ring to enter into the skirt and to be pushed against the screen assembly. The complication and expense of providing the clips, used in the prior arrangement, is thereby avoided. Furthermore, the sealing arrangement can provide a better seal against any of the material being sieved passing between the locating ring and the rim whence it can escape from the sieving machine.

110 Preferably, the locating ring is formed with a circumferential groove about its periphery and the sealing means is located in the groove. Then, the sealing means may be conveniently an O-ring seal. The locating ring may conveniently be spin-formed.

The invention also envisages a screen assembly locating ring for a circular sieving machine of the kind described comprising a complete annulus sized to fit inside the downwardly extending skirt of the demountable rim of the machine and adapted to cooperate with deformable sealing means which, when located between the outer periphery of the locating ring and the skirt, enables the locating ring to be pushed into the skirt to locate the screen assembly in the rim with the sealing means deforming and providing a seal between the skirt of the rim and the locating ring.

An example of the present invention will now be described with reference to the accompanying drawing which is a cross-sectional view of part of a sieving machine incorporating an embodiment of the present invention.

The drawing illustrates a cross-sectional view in elevation of part of a circular sieving machine of the kind described. The line 10 indicates the central vertical axis of the machine and the components of the machine illustrated in the drawing are substantially symmetrical about this axis.

In the drawing, a demountable rim 11 is shown positioned on an under-pan 12. The sieve screen 13 is mounted in the rim 11 and is identified by the chain dotted line indicated. The screen 13 extends substantially horizontally and is circular. Normally, the rim 11 is held in place on the under-pan 12 by means of clamps not shown. The entire assembly including the under-pan 12 and the rim 11 with the enclosed screen 13 is vibrated, when the machine is operating by vibratory apparatus not shown in the drawing. The manner in which the screen is vibrated forms no part of the present invention, although it is normal for the vibratory motion to be substantially in the plane of the screen 13 with a relatively smaller vertical component.

Considering the drawing in more detail, the rim 11 is formed as an open-ended short cylinder having an annular shoulder 14. The rim 11 is orientated so that the outer surface of the shoulder 14 is directed upwardly. Thus, the lower portion 15 of the rim 11 is formed as a downwardly extending skirt.

The screen 13 is located inside the skirt portion 15 of the rim 11. The screen 13 comprises a flexible mesh which is wrapped, about its periphery, around a support ring 16. The support ring 16 is relatively rigid and is commonly made of stainless steel or aluminium. The outer peripheral edge of the support ring 16 has a circumferential groove and the screen 13 is clamped to the ring 16 by means of a clip 18 which tightly embraces the edge portion of the screen 13 and clamps it into the grooves 17. A gasket 19 of deformable material such as rubber is positioned between the screen 13 and the ring 16 where the screen is wrapped over the edge of the ring. This gasket 19 protects the screen 13 from the effects of wear resulting from any frictional contact between the screen and the metal surface of the ring 16. A further channel gasket 20 embraces the entire peripheral part of the assembly formed by the screen 13 and the support ring 16. The gasket 20 is also formed of a deformable material such as rubber and protects the edge portion of the screen assembly from possible contact with other metal surfaces in the machine. The complete screen assembly is located inside the skirt portion 15 of the rim 11 up against

the inside surface of the shoulder 14. Between the screen assembly and the shoulder 14 a further annular gasket 30, typically of rubber, is located.

Beneath the screen assembly a locating ring 21 is also fitted inside the skirt 15 of the rim 11. The locating ring 21 holds the screen assembly firmly against the inside surface of the shoulder 14 of the rim. As illustrated in the drawing, the locating ring is formed as a complete annular member, typically of metal such as stainless steel or aluminium. The locating ring 21 is formed as a channel having a base portion adjacent the inner surface of the skirt 15 and flange portions extending radially inwardly. The upper flange portion 22 has an upwardly directed lip 23 and is arranged so that the support ring 16 of the screen assembly can locate around the lip 23 resting, via the channel gasket 20 on the flange portion 22.

The base portion of the locating ring 21 is formed with a peripheral groove 24 in which is located an O-ring sealing member 25. The O-ring seal 25 is of a deformable material such as rubber. The arrangement is such that the O-ring is compressed between the locating ring 21 and the inside surface of the skirt 15 of the rim. In this way, the locating ring 21 can be retained in the skirt 15 by frictional contact between the O-ring seal 25 and the skirt 15. Furthermore, the seal 25 serves to prevent any material being sieved from escaping between the support ring 21 and the rim 11.

The entire rim assembly including the rim 11 and the screen assembly and the locating ring 21 is mounted on the under-pan 12 of the sieving machine. As shown in the drawing, the under-pan 12 has a substantially horizontal annular portion 26 surrounded by an upwardly directed flange 27. The rim assembly is located inside the flange 27 resting on the horizontal portion 26, via a further annular gasket 28. The gasket 28 is arranged so as to substantially mate with the lower flange portion of the locating ring 21 and the dimensions of the components enclosed within the skirt 15 of the rim 11 are such that the entire rim assembly rests on the under-pan with the lower flange of the locating ring 21 bearing on the gasket 28, but with the lower end of the skirt 15 clear of the under-pan. Then, it can be seen that, when the demountable rim assembly is clamped in place by means of a clamp applying a downward pressure on the shoulder 14, the clamping pressure is applied, via the locating ring 21 directly to the support ring 26 of the screen assembly so that the screen assembly is firmly held up against the inside surface of the shoulder 14.

In order to remove the screen assembly 16 it is a relatively simple matter to release the clamps holding the rim assembly in place and

remove the entire rim assembly complete with the screen assembly and locating ring 21. The locating ring 21 can be withdrawn from the skirt 15 simply by pulling so that the O-ring seal 25 either slides or rolls over the internal surface of the skirt 15. The groove 24 is arranged to retain the O-ring seal 25 in place even during this withdrawal process. Once the locating ring 21 is removed, the screen assembly can easily be withdrawn also to give access to the screen itself. To reassemble the sieving machine, the same steps can be followed in reverse order.

15 CLAIMS

1. A circular sieving machine of the kind described wherein the screen assembly locating ring is formed as a complete annulus fitting inside the downwardly extending skirt portion of the demountable rim and deformable sealing means is located between the outer periphery of the locating ring and the skirt portion to enable the locating ring to be pushed into the skirt against the screen assembly to locate the screen assembly in the rim with the sealing means deforming and providing a seal between the skirt of the rim and the locating ring.
2. A sieving machine as claimed in claim 1, wherein the locating ring is formed with a circumferential groove about its outer periphery and the sealing means is located in the groove.
3. A sieving machine as claimed in claim 2 wherein the sealing means is an O-ring seal.
4. A sieving machine as claimed in claim 2 or claim 3, wherein the locating ring is spin-formed.
5. A screen assembly locating ring for a circular sieving machine of the kind described comprising a complete annulus sized to fit inside the downwardly extending skirt portion of the demountable rim of the machine and adapted to cooperate with deformable sealing means which, when located between the outer periphery of the locating ring and the skirt, enables the locating ring to be pushed into the skirt to locate the screen assembly in the rim with the sealing means deforming and providing a seal between the skirt of the rim and the locating ring.
6. A locating ring as claimed in claim 5 and formed with a circumferential groove about its outer periphery for locating the sealing means therein.
7. A locating ring as claimed in claim 6 which is spin-formed.
8. A locating ring as claimed in either of claims 6 and 7 in combination with an O-ring seal located in the groove.
9. A sieving machine substantially as hereinbefore described with reference to the accompanying drawing.

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